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ABSTRACT

Fry's Readability Graph was used to determine the readability levels of the 1981 Scott, Foresman and Co. basal textbook series for grades one through six. The readability levels were then compared to those established for the 1978 edition. In the 1981 edition, all stories were hand-scored. Poems, skill lessons, and plays were not examined in order to conform to the method used to analyze the 1978 edition. In scoring each story, the first 100 words, the middle 100 words, and the last 100 words were studied and analyzed. Results showed that aside from moderate intragrade level increases in difficulty, the readability levels of the 1981 edition were similar to those established in the 1978 edition. Analysis of each basal text revealed a wide variation of grade levels from story to story. Moreover, there was no linear progression of story difficulty within each textbook. Another deficiency was observed in the third grade texts. Their readability levels (4.1 and 4.0 respectively) indicated that the material might be too difficult for the average third grade student. (HOD)

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THE READABILITY LEVELS OF THE 1981
SCOTT, FORESMAN AND CO. BASAL TEXTS AND
THEIR COMPARISON WITH THE 1978 EDITION

by

Bonnie Ackerman

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4/18/83
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requirements for the Master of Arts Degree in
Reading Specialization at Kean College of New Jersey

April 1983

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ABSTRACT

Fry's Readability Graph was used to determine the readability levels of the 1981 Scott, Foresman and Co. basal texts. The readability levels were then compared to those established for the 1978 edition. Aside from moderate intra-grade level increases in difficulty, the analysis of the readability levels were found to be similar. The need for less readability variation within each text was indicated.

TABLE OF CONTENTS

	Page
I Abstract	1
II List of Tables	iii
III The Readability Levels of the 1981 Scott, Foresman and Co. Basal Texts and Their Comparison With the 1978 Edition	
Introduction	1
Design of the Study	5
Analysis of Data	8
Conclusions & Implications	30
IV Readability: Related Literature & Research	33
V References	40

LIST OF TABLES

Table	Page
I Graph for Estimating Readability	7
II Readability Results for <u>Kick Up Your Heels</u> - Level 4 (Grade 1)	10
III Readability Results for <u>Rainbow Shower</u> - Level 5 (Grade 2 ¹)	12
IV Readability Results for <u>Crystal Kingdom</u> - Level 6 (Grade 2 ²)	14
V Readability Results for <u>Hidden Wonders</u> - Level 7 (Grade 3 ¹)	16
VI Readability Results for <u>Golden Secrets</u> - Level 8 (Grade 3 ²)	18
VII Readability Results for <u>Sea Treasures</u> - Level 9 (Grade 4)	22
VIII Readability Results for <u>Sky Climbers</u> - Level 10 (Grade 5)	25
IX Readability Results for <u>Star Flight</u> - Level 11 (Grade 6)	28
X Comparison of the Average Readability Levels of the 1978 Edition and the 1981 Edition	29

Virtually every student learning to read is presented with a series of basal texts, the contents of which become more difficult as the student masters each skill level. Educators and students alike utilize these basal texts assuming that they have been properly analyzed and developed in a systematic progression of reading skills. Moreover, these books are presumed to correlate exactly to the reading level sought to be mastered.

Teachers often question the validity of the grade level when confronted with a reading group which is unable to master the skills thought to be imparted by the story. When faced with such a dilemma, teachers become frustrated and must choose a variety of alternatives. They can spend additional time teaching vocabulary, which may lead to self doubt as to one's ability or the ability of the students. Conversely, the educator may dismiss the problem as a publisher's error in demanding too much of the student and gloss over the problem. Either alternative has a negative result. The object of the lesson has been lost. The publisher's thrust and attempt to introduce new vocabulary has been unsuccessful. One must query whether the problem lies with the students' inability to grasp the lesson, or whether the material presented by the publisher is too complex and not indicative of the grade level.

For in excess of 100 years, educators and related researchers have been studying the problems associated with

readability of printed material. Formulae designed to compute readability levels were continually refined during this period.

Herbert Spencer, in 1852, published an article which is thought to mark the beginning of interest in the concept of readability. According to Spencer, the time and energy used to decode words detracts from the act of comprehension. He concluded that there was an advantage to using the smallest amount of words and syllables to express an idea.

The variables of words and syllables, as important concepts, became an integral part of many readability formulae.

In his 1943 study, Rudolph Flesch popularized the theory of readability and established an important concept in communication through his many books and articles. Educators and authors alike became aware of word length and style. Flesch's Reading Ease Formula, however, was quite time consuming and others sought to find easier methods. Dale and Chall, in 1948, designed a readability formula to correct inconsistencies in Flesch's measurements. They used a larger word list as a better predictor and a shorter, more easily defined formula.

In 1968, Edward Fry refined earlier studies and created a generally accepted method of determining readability. Originally geared to African readers, Edward Fry's

Readability Graph is considered among the easiest to compute and is consistent with older formulas. The average number of syllables and number of sentences per 100 words are plotted on the graph to determine the grade level. Like the Dale-Chall formula, it is based on a prediction criterion of 50 to 75% comprehension and is accurate to within a grade level.

Concern continues for adequate reading instructional materials prompting readability studies in this area. Prior research by Strang (1944), Bradley & Ames (1977), Eberwein (1979) and others profess a continuing need for readability studies updating former research leading to improve the effectiveness and efficiency of instruction.

Using Fry's formula, readability levels have been established through 1978 in a work entitled Foxie. Few published readability studies have been performed since that time, indicating a need to update published material in this field.

Teachers require updated materials concerning variations in the readability levels of various textbooks. This information, if available, would enable the educator to make informed decisions concerning accurate basal text placement of students. Instruction and the ability to adjust to individual needs can be greatly enhanced when the difficulty level of the material is provided. An informed teacher,

aware of variations in readability levels, will be prepared for or can avoid problems arising from difficult passages.

HYPOTHESIS

It is imperative to analyze basal reading systems in detail to confirm or negate the grade level placement as established by the publisher when compared to readability tables as established by Fry. This study will endeavor to establish whether or not the prescribed grade level of each basal reading text of the 1981 edition of Scott, Foresman & Co. is a true reflection of its reading level.

There exists a positive correlation between readability levels and the graded texts of the subject basal reading series. A sub-hypothesis opines that the correlation will be greater in the 1981 edition than the 1978 edition.

DEFINITIONS, ASSUMPTIONS AND LIMITATIONS

Definitions

Basal Reading: Basal reading is an orderly method of teaching children to read by giving them daily instruction in reading. It is based on a systematic sequence of skills.

Readability: Readability is an estimate of the difficulty of a reading passage.

Reading Level: Reading level is the ability to decode a passage of 100 words with no more than 5 errors.

Assumptions

The Readability Graph, as designed by Edward Fry, is accurate for assessing readability.

The readability studies published in Foxie are valid.

The criterion for determining a specific grade level, or subdivision thereof, has remained constant since its development.

Limitations

The study was limited to the 1978 and 1981 Scott, Foresman & Co. basal texts, grades 1-6.

DESIGN OF THE STUDY

The readability of stories and textbooks can be determined by a variety of formulae, such as Spache, Dale-Chall, Flesch and Fry. In this research, the Fry formula was used to determine the readability of the 1981 Scott, Foresman & Co. basal textbook series, grades 1-6. The study compares these results with research previously performed on the 1978 edition (Foxie, 1979). This comparison was able to be performed as both relied upon Fry's Readability Graph, utilizing identical methods as set forth below.

After detailed research into the various methods of determining readability of textbooks, the Fry formula, utilizing the Fry Readability Graph, was chosen based upon its ease of utilization and accuracy of result. According to Klare (1975), Fry's two variable formula is sufficient to predict readability, especially if one variable is a word variable, as is the case with the Fry graph. Klare also considers sentence complexity as the key factor in difficulty, but states that the sentence length correlates highly and is easier to count. Thus, Fry's Readability Graph appears to give a sufficient estimate in predicting readability of textbooks.

The Fry formula was chosen because of its familiarity with educators, its ease of scoring and has fewer variables to score than other formula, resulting in less error (Klare, 1976). Unlike Dale-Chall, there is no word list that needs to be updated. It is based upon sentence length and the number of syllables of words, making the formula easy to learn and interpret.

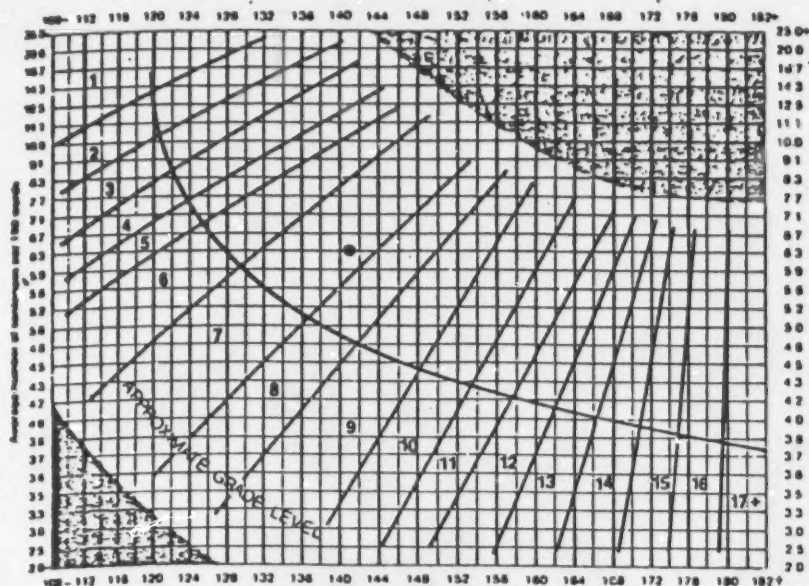
The procedure required to apply the Fry formula required three 100 word passages in each story. The number of syllables and the number of sentences were counted on every 100 word passage. A syllable was counted for each vowel sounded in a word. In case of numerals and initializations, one syllable was counted for each symbol. Then the sentences and syllables were averaged, and the results

TABLE I

GRAPH FOR ESTIMATING READABILITY — EXTENDED

by Edward Fry, Rutgers University Reading Center, New Brunswick, N.J. 08902

Average number of syllables per 100 words



Expanded Directions for Working Readability Graph

1. Randomly select three (3) sample passages and count out exactly 100 words each, beginning with the beginning of a sentence. Do count proper nouns, initializations, and numerals.
2. Count the number of sentences in the hundred words, estimating length of the fraction of the last sentence to the nearest one-tenth.
3. Count the total number of syllables in the 100-word passage. If you don't have a hand counter available, an easy way is to simply put a mark above every syllable over one in each word, then when you get to the end of the passage, count the number of marks and add 100. Small calculators can also be used as counters by pushing numeral 1, then push the + sign for each word or syllable when counting.
4. Enter graph with *average* sentence length and *average* number of syllables; plot dot where the two lines intersect. Area where dot is plotted will give you the approximate grade level.
5. If a great deal of variability is found in syllable count or sentence count, putting more samples into the average is desirable.
6. A word is defined as a group of symbols with a space on either side; thus, Joe, IRA, 1945, and & are each one word.
7. A syllable is defined as a phonetic syllable. Generally, there are as many syllables as vowel sounds. For example, *stopped* is one syllable and *wanted* is two syllables. When counting syllables for numerals and initializations, count one syllable for each symbol. For example, 1945 is four syllables, IRA is three syllables, and & is one syllable.

plotted on the Fry graph, thereby determining a grade level for each story.

Fry defines a word as a group of symbols with a space on either side. In accordance with Fry's Revised Readability Graph (Fry, 1977), proper nouns were included.

In the Scott, Foresman & Co. 1981 edition, all stories were handscored. Poems, skill lessons and plays were not examined in order to conform to the method used to analyze the 1978 edition (Foxie, 1979). In scoring each story, the first 100 words, the middle 100 words and the last 100 words were studied and analyzed.

ANALYSIS OF DATA

The results of this study can be seen in Tables II-IX which list the readability results for each text, grades 1-6. Readability results of the Grade 1 basal textbook, as set forth in Table II, disclosed that only 9 stories, or 33.3%, were at grade level. The average readability was 1.7. In the 2nd grade books, as indicated in Table III & IV, the percentage of stories at grade level was 50%. Both these texts had few stories with readability levels below grade level. Tables V & VI revealed that the stories at grade level dropped to approximately 30%. Both texts had at least 50% of the stories above grade level, which gave these 3rd grade reading textbooks average reada-

TABLE II
Readability Results for Kick Up Your Heels-
Level 4 (Grade 1)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
8	The Bird & the Pitcher	1
16	What I Have to Give	1
24	Look Out for Mr. Quills	2
32	Going Somewhere Special	1
40	The Four Know-Littles	2
50	From A to Z	1
58	How to Get Warm	1
66	The Ugly Duckling	2
76	Weather People	2
84	Three Nights of Magic	2
92	What a Day!	1
100	The Elves & the Shoes	1
110	Out of the Oven	2
118	How can This Be?	2
137	Who Will Fill Up the Little House?	1
147	At Home on the Ranch	2
155	My Own Foal	2
163	Tomo Says Something Special	2
173	Funny Mr. Dee	2
181	On Stage	2
199	The Fence	3
207	Jean Doesn't Need Help	2
215	You Never Know What You Will Find	2
223	The Apple Tree Behind the House	2
233	Grand Teton National Park	2
241	Animals You Can't See	3
249	Mr. Grumpy's Motor Car	1

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	-	-
Stories At Grade Level	9	33.3
Stories Above Grade Level	18	66.7
Average Readability of Book - 1.7		
Range of Stories - 1-3		

Graph of Readability of Stories

College

GRADE
LEVEL

12
11
10
9
8
7
6
5
4
3
2
1
0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

NUMBER OF STORIES

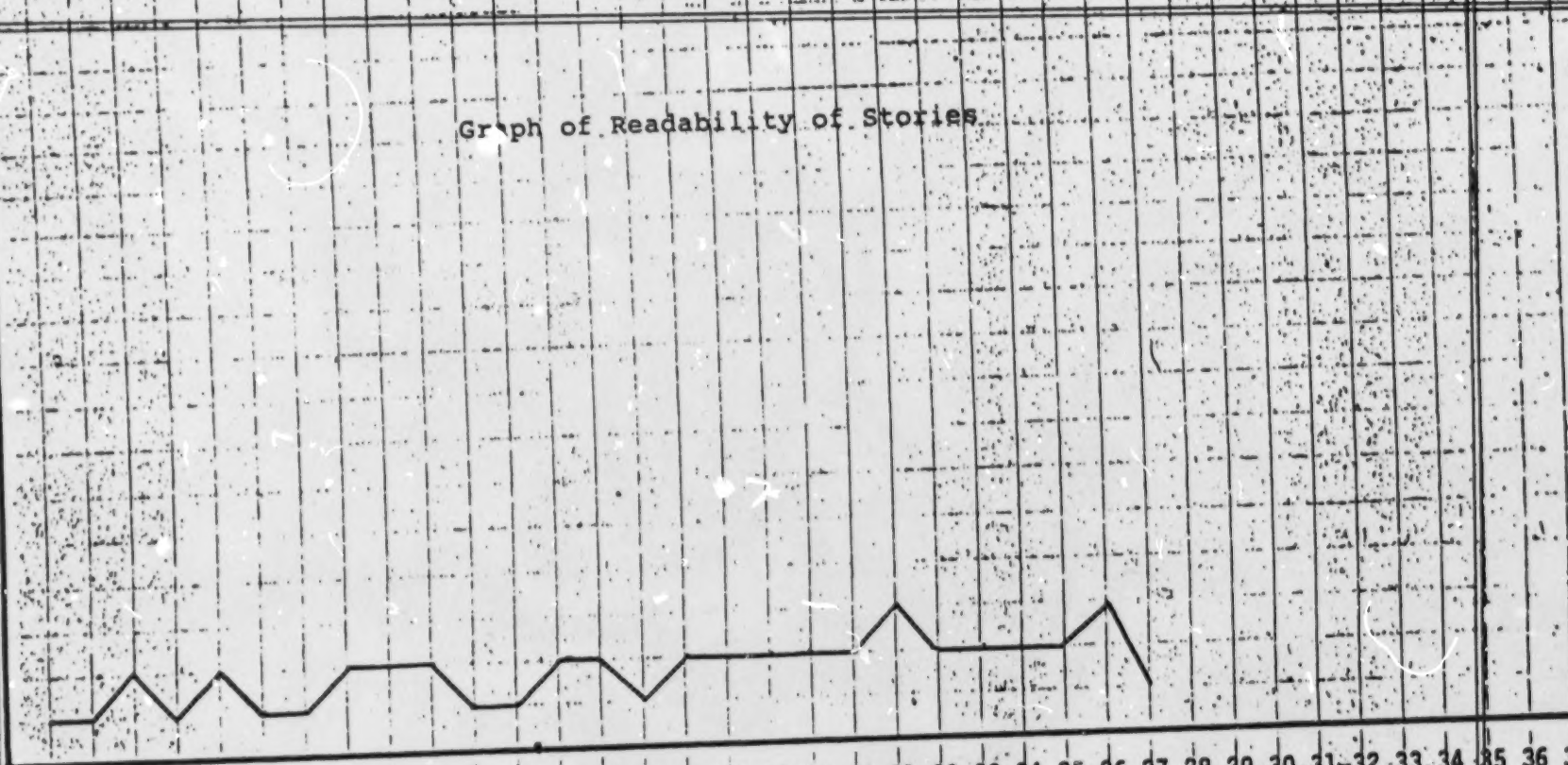


TABLE III
Readability Results for Rainbow Shower-
Level 5 (Grade 2¹)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
8	The Garden	1
18	Millicent Maybe	2
28	Ebbie	4
38	Gwendolyn Brooks-A Child Alone	4
46	A Special Rock	3
56	Madge's Magic Show	1
67	That's What Friends are For	2
79	A Dog for Maria	3
87	Do You Have the Time, Lydia?	3
102	Sound Around Us	2
109	The Big Enormous Cat	3
119	Linda's Invention	2
129	Stone Soup	2
142	The Flying Patchwork Quilt	2
155	Possum Was Fooled	2
173	QUBE TV	2
183	The Mysterious Shadow	3
202	The New Girl in School	2
211	Millie Ran Away	2
218	The Magic Spectacles	3
226	Plants do Strange Things	2
235	Two Good Friends	1
242	How to Give a Magic Show	3
248	The One in the Middle is a Green Kangaroo	2

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	3	12.5
Stories At Grade Level	12	50.0
Stories Above Grade Level	9	37.5
Average Readability of Book - 2.4		
Range of Stories - 1-4		

Graph of Readability of Stories

College

GRADE LEVEL

12
11
10
9
8
7
6
5
4
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0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

NUMBER OF STORIES

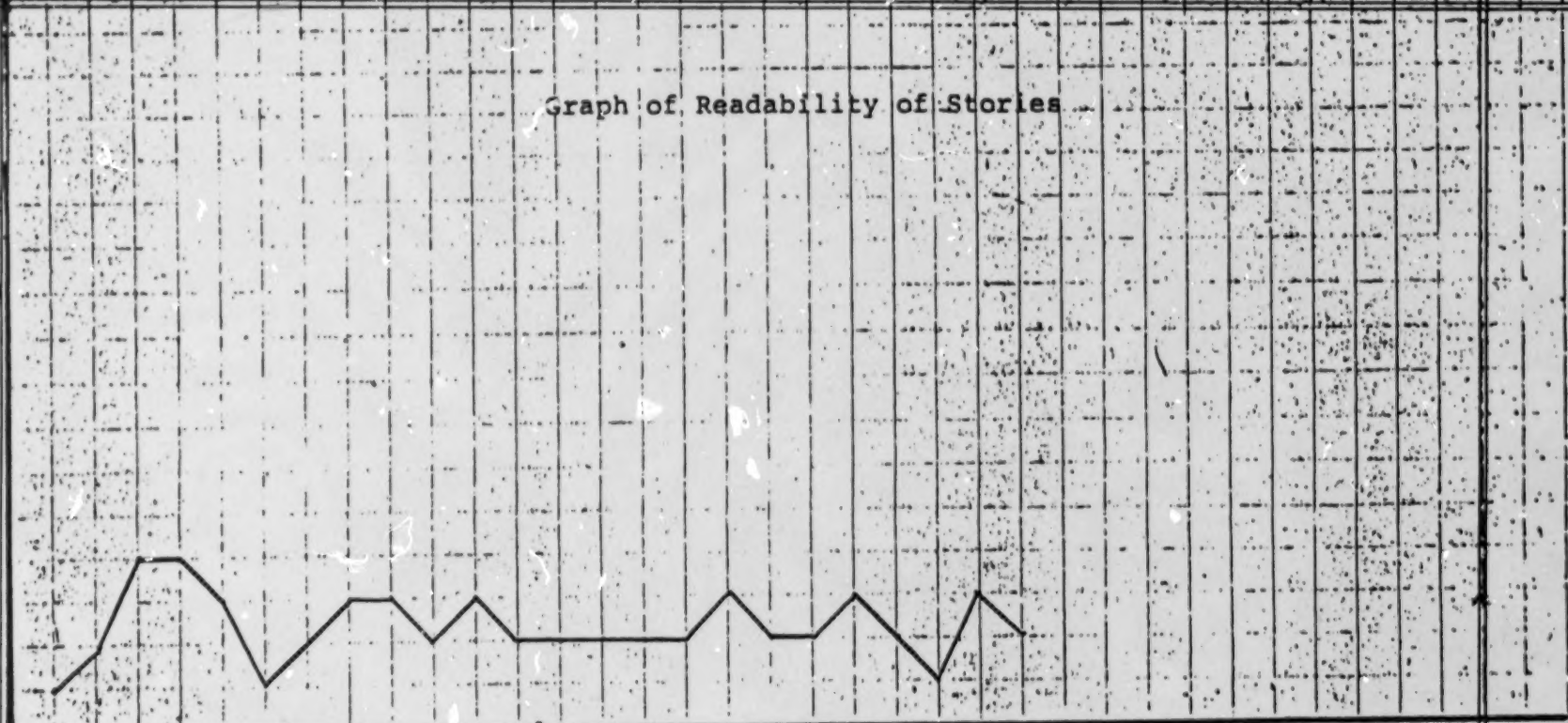


TABLE IV
Readability Results for Crystal Kingdom-
Level 6 (Grade 2²)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
8	Benjamin Dilley's Thirsty Camel	3
22	Mr. Egbert Nosh	2
33	Gabrielle & Selena	4
50	Everyday Music	3
59	Fidelia	4
72	The Surprise Kingdom	2
88	A Report from the Zoo	2
99	Kid Dynobite	1
110	Mrs. Ling's Cat	2
125	Looking at Masks	2
132	Kate's Swimming Pool	2
145	Grandpa, Me and Our House in the Tree	2
154	Giants are Very Brave People	3
168	Angela and the Bear	2
179	A Brand-new Beautiful Me	2
190	The Spider Plant	2
201	Nothing Much Happened Today	3
208	Navajo Pet	2
221	Cover to Cover	2
230	Jenna's Newspaper	3
245	Eddie Couldn't Find the Elephants	2
253	A Quiet Place	5
266	Mystery Messages	3
277	The Alligator Under the Bed	3
289	On Your Mark, Get Set, Go!	4
295	The Great Blueness and Other Predicaments	4

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	1	3.8
Stories At Grade Level	13	50.0
Stories Above Grade Level	12	46.2
Average Readability of Book - 2.7		
Range of Stories - 1-4		

Graph of Readability of Stories

College

GRADE LEVEL

12
11
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

NUMBER OF STORIES

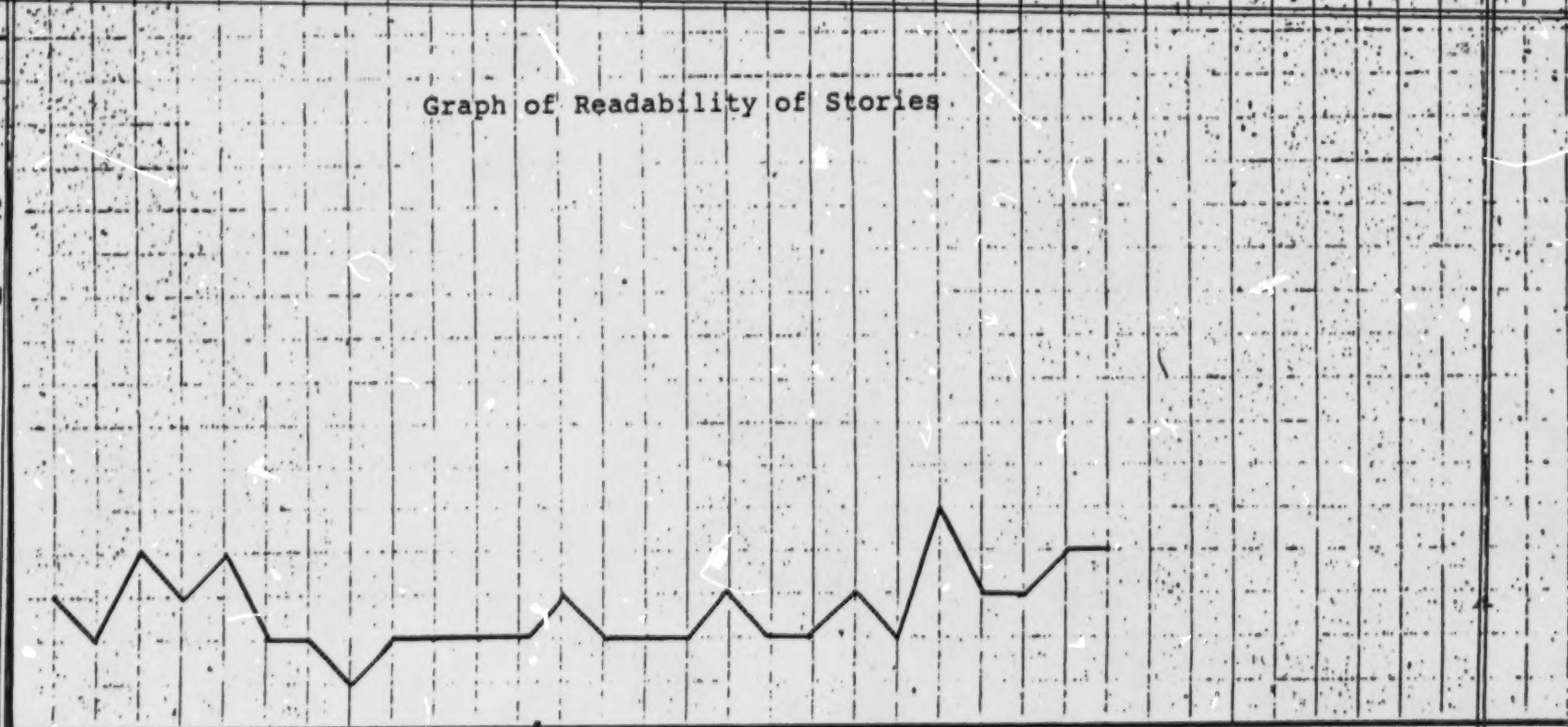


TABLE V
Readability Results for Hidden Wonders-
Level 7 (Grade 3')

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
8	You Look Ridiculous	6
25	Sally Ride: Scientist-Astronaut	7
33	The Elephant Trainer	5
48	Pecos Bill Rides a Tornado	3
61	Delilah	3
73	How is a Table Like You?	1
85	An Island is Born	5
93	Somebody Stole Second	1
102	Jack and the Beanstalk	2
117	The Private Eyes	3
129	The Dance Theatre of Harlem	7
145	Tall Tina	3
155	Pooh Goes Visiting	5
170	Mary of Mile 18	3
182	The Three Wonderful Seeds	4
194	Wild Canada Geese	5
205	Peter's Brownstone House	5
216	Chameleon Was a Spy	4
233	The Ultimate Auto	6
245	The Bicycle and How it Works	6
259	The Bravest Babysitter	3
271	The Case of the Broken Globe	6
280	Kitchen Window Gardens	5
293	Kevin Cloud, Chippewa Boy in the City	3
305	How Old is Old?	2
317	Freckle Juice	3

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	4	15.4
Stories At Grade Level	8	30.8
Stories Above Grade Level	14	53.8
Average Readability of Book - 4.1		
Range of Stories - 1-7		

Graph of Readability of Stories

College

GRADE LEVEL

12
11
10
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8
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1
0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

NUMBER OF STORIES

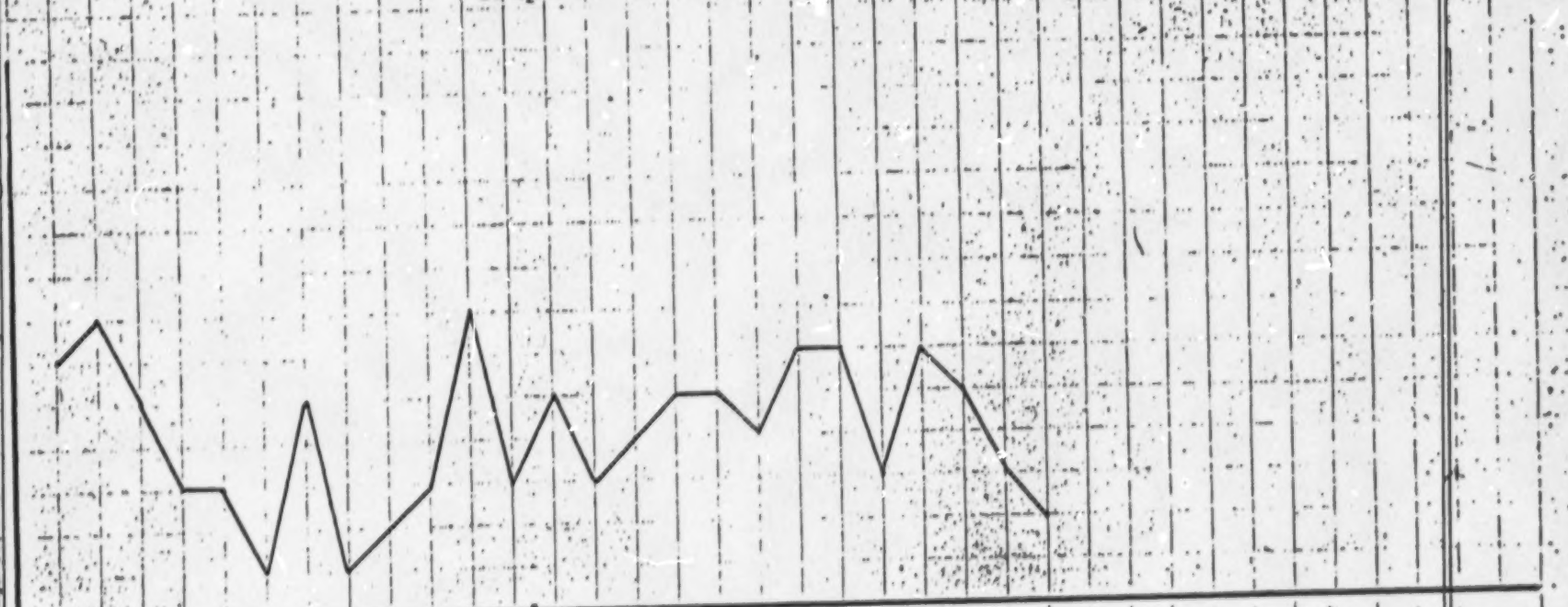


TABLE VI
Readability Results for Golden Secrets-
Level 8 (Grade 3²)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
8	The Great Hamster Hunt	4
25	Why Wasn't I Asked to the Party	3
37	Anya's Adventure	2
52	Weather Wisdom	5
62	Engine Number Seven	2
79	I Have a Sister, My Sister is Deaf	3
93	If I Rode a Dinosaur	6
103	Popular Invention	7
129	Benjamin Banneker	8
140	The Tree House	4
155	The Shoeshine Chair	3
168	The Emperor's New Clothes	5
182	Yagua Days	3
196	The Baobab Automobile	3
208	Why Cowboy's Sing, In Texas	2
221	The Queen Who Changed Places with the King	3
230	Petey	5
247	An Anteater Named Arthur	4
260	What's a Ghost Going to Do?	5
276	My Grandpa and Me	3
288	The Skates of Uncle Richard	3
306	Patsy and the C.B.	4
313	Listening in on C.B.	5
321	Merlin and Merlin	3
334	The Answer-Backer Cure	6
347	Amos and Boris	4

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	3	11.5
Stories At Grade Level	9	34.6
Stories Above Grade Level	14	53.9
Average Readability of Book - 4		
Range of Stories - 2-8		

Graph of Readability of Stories

College

GRADE LEVEL

12
11
10
9
8
7
6
5
4
3
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0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37

NUMBER OF STORIES

bilities of 4th grade. At the 4th grade level, the data in Table VII revealed an average readability of 4.3. However, there were almost as many stories below grade level as above grade level. The results for the 5th grade textbook, listed in Table VIII, showed a varied distribution of stories below, at and above grade level which resulted in an average readability of 5.1.

Table IX indicated that 14 stories, or 29.8%, were at grade level. The average readability of the 6th grade book was found to be 5.6.

The analysis of the combined data revealed that the range of readability levels of stories within each book varied greatly. The range in levels varied from 3 grade levels in the Level 4, Grade 1 textbook to 8 grade levels in the Level 11, Grade 6 textbook. The results also indicated that there was no logical flow of readability levels of stories. The pattern of readability of stories did not increase gradually in reading levels such as indicated in the 3rd grade book. Table VI showed that the book began with a 4th grade story, then a 3rd grade, then a 2nd, a 5th, a 2nd, etc. Analysis of the 8 texts revealed that 5 books, or 62.5%, had the majority of stories above grade level, 2 books, or 25%, had the majority of stories at grade level, and 1 book, or 12.5%, had the majority of stories below grade level.

TABLE VII
 Readability Results for Sea Treasures-
 Level 9 (Grade 4)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
10	Mr. Popper's Penguins	7
23	Something Strange at the Ballpark	3
32	Blue Moose	3
44	Carousel Horses	7
54	Argyle	4
63	The Courage of Emily Geiger	5
73	Tigger	4
84	The Boy Who Wouldn't Talk	3
94	Something for Everyone!	3
110	Charlotte's Web	4
122	Maybe, a Mole	4
135	The Invisible Girl	3
142	Socks	5
160	Eugenie Clark	5
173	Nate the Great Goes Undercover	2
183	The Ghost in the Orchard	4
216	From Corn to Minnesota	8
221	Kevin's Grandma	4
233	The Clever Princess	6
246	Sam, Bangs and Moonshine	4
262	Summer of the Monkeys	4
278	Amelia and the Bear	4
287	Kidding Around	4
299	What Makes a Bird a Bird?	2
311	My Garden Grows	2
318	Rebecca and Abigail Bates, the Army of Two	5
326	Benny's Flag	3
337	Elizabeth Blackwell, Pioneer Doctor	5
344	Secret of the Tinkling Cave	3
360	Misty of Chincoteague	6
377	Sasha, My Friend	2
394	About Dolphins	3
401	Rhyming Ink	4
416	Wesley Paul, Marathon Runner	5
426	The Marathon	8
431	A Tree This Tall	3
440	The Day the Circus Came to Lone Tree	5

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
453	Gliding on the Wind	3
461	Portrait of Myself	5
467	Henry O. Tanner, Artist	5
471	Treasure Beneath the Sea	5
480	McBroom, the Rainmaker	4
492	Henry Huggins	5
506	The Cricket in Times Square	5

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	14	31.8
Stories At Grade Level	13	29.6
Stories Above Grade Level	17	38.6

Average Readability of Book - 4.3

Range of Stories - 2-8

Graph of Readability of Stories

College

GRADE
LEVEL

12
11
10
9
8
7
6
5
4
3
2
1
0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

NUMBER OF STORIES

TABLE VIII

Readability Results for Sky Climbers -
Level 10 (Grade 5)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
11	The Midnight Fox	7
27	Secret of the Aztec Idol	3
38	Chino's Tale	4
55	Police Horses	5
67	Mary's Monster	5
77	A Talk With a Beekeeper	5
89	Archie has a Visitor	6
99	Sunday's Child	3
106	Ride a Northbound Horse	6
122	Trail to Oregon	3
130	The House of Dies Drear	5
146	The Ghost on Saturday Night	3
165	The Magic Meadow	5
178	Betsy's Book Begins	3
198	Meet the Miracle Chip	7
207	Harriet Quimby Flies the Channel	6
221	Haunted American History	5
232	Shark!	3
239	What Work Shall I Choose?	6
252	Close Call for the Woopers	6
255	The Whooping Crane	6
260	Island of the Blue Dolphin	7
274	The Cat and the Fiddler	7
294	Mystery Drawings on the Nazca Plains	7
301	The Popcorn Blizzard	5
311	Answering Hard Questions	5
323	Coyote Cry	4
330	I Carve Stone	5
344	An Interview with Jacques Yves Cousteau	6
349	Shipboard Oceanographers	7
359	Greyling	3
367	Marathon Miranda	5
378	The Man who Walked and Talked	6
386	From and Now Miguel	4
412	The Princess and the Admiral	5
433	Going Where There's Fire	6
440	The Mayo Brothers	7
453	Sarah Says	5
463	Seeking Life on Mars	7

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
467	Xixobrax	4
474	The Comeback	5
485	Influential Assignment	4
499	Women in the Wilds	6
506	The Captain's Castle	3
514	Lights that Guide	
	Ships Home	6
532	Justin Morgan had a Horse	4

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	14	30.4
Stories At Grade Level	13	28.3
Stories Above Grade Level	19	41.3

Average Readability of Book - 5.1
 Range of Stories - 3-7

Graph of Readability of Stories



TABLE IX

Readability Results for Star Flight-
Level 11 (Grade 6)

<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
10	Henry Reed's Baby Sitting Service	5
30	Diary of Yeddo Ski-Kredo	5
36	The Green Thumb Case	4
44	Can You Hurt a Plant's Feelings?	6
54	The Great Storm	7
75	Treasure of a King	5
83	All Things Wise and Wonderful	5
100	The White Cloud	4
114	Hamish and the Redcoat	3
125	The Problem Solver and the Spy	6
138	The Blizzard	4
147	The Endless Steppe	4
162	The Phantom Tollbooth	5
181	Outdoor Dramas - History Where it Happened	7
188	Jacob Lawrence: A Master of American Art	6
200	Snobber	6
213	Lifeboat in Space	5
220	Michael Farraday's World	7
236	Leander, the Remarkable Snake	6
247	Tai Babilonia	5
257	Left-hander's World	7
271	The Wind in the Willows	3
286	From Freedom Trail	7
302	Harry the Heavyweight	4
311	Dreamers in a Carat Patch	3
321	Henry Aaron: Home-Run King	5
332	Planting Story Seeds	6
334	The Stone Dog	5
339	A Job	4
347	Discovering a Living Fossil	10
356	The Chase Down Tanglewood	6
380	Bee Time	6
396	Pedal Power	8
401	The Truthful Harp	5
414	My Side of the Mountain	4
432	The Trouble at Tektite 3000!	5

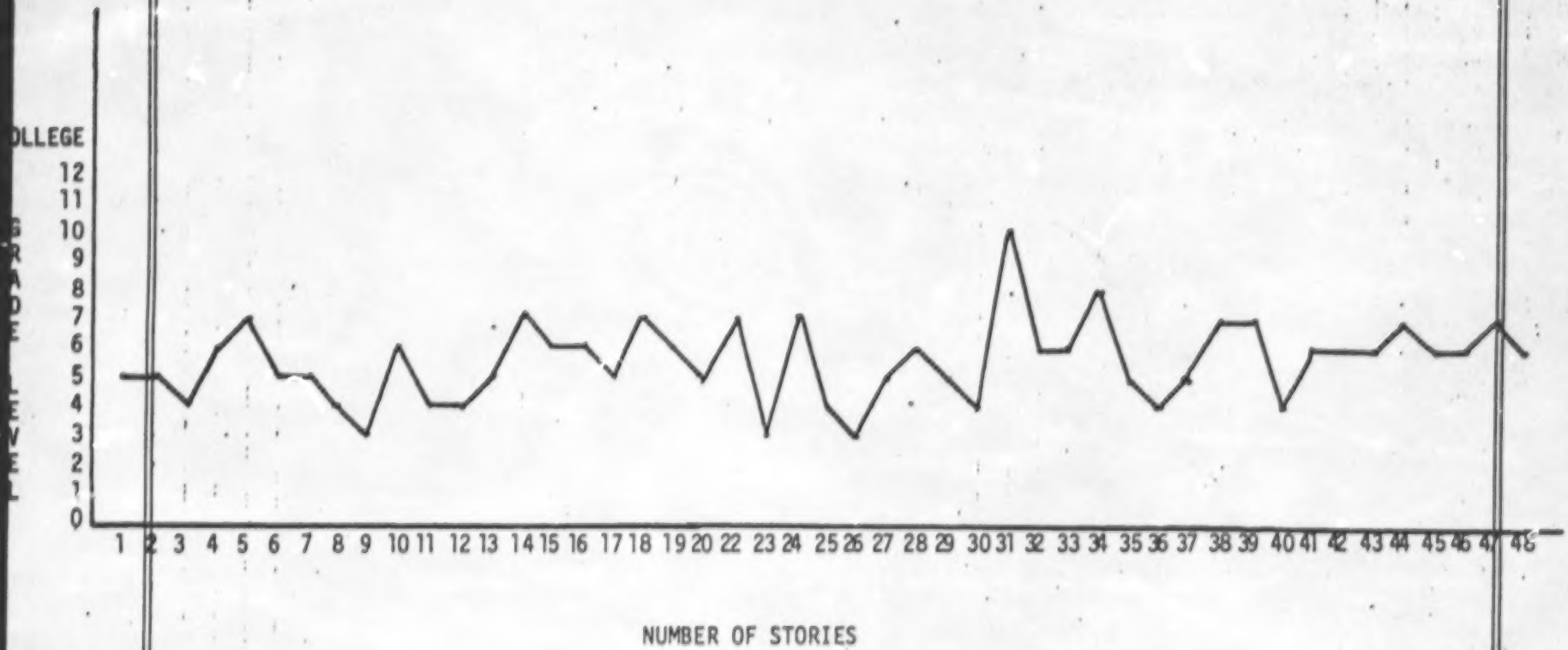
<u>Page</u>	<u>Story</u>	<u>Readability Level</u>
442	Rakel's Star-House	7
451	The UFO Mystery	7
459	Jeans, Jeans, Jeans	4
468	The Battle of the Goddesses	6
471	The White Mustang	6
487	The Day Grandfather Tickled a Tiger	6
485	The Ways of Tigers	7
496	A Polar Ghost Ship	6
501	The Strange Return of the Frigorifique	6
514	She Knew What She Wanted	7
529	The Nightingale	6

Summary

	<u>Number</u>	<u>Percent</u>
Stories Below Grade Level	22	46.8
Stories At Grade Level	14	29.8
Stories Above Grade Level	11	23.4

Average Readability of Book - 5.6
Range of Stories - 3-10

Graph of Readability of Stories



Differences in the average readability levels between the 1978 Scott Foresman & Co. edition and the 1981 edition were also investigated. As shown in Table X, the

TABLE X

Comparison of the Average Readability Levels
of the 1978 Edition and the 1981 Edition

<u>1978 Edition, Basics in Reading Grade Level</u>	<u>Average Readability</u>	<u>1981 Edition Grade Level</u>	<u>Average Readability</u>
1 ²	1.3	1	1.7
2 ¹	1.7	2 ¹	2.4
2 ²	2.5	2 ²	2.7
3 ¹	3.0	3 ¹	4.1
3 ²	3.3	3 ²	4.0
4	3.8	4	4.3
5	4.5	5	5.1
6	5.0	6	5.6

average readability of each text increased from a minimum of .2 levels to a maximum of 1.1 levels, which resulted in actual grade differences in 5 of the 8 1981 textbooks. The 1st, 2nd and 6th grade books showed little change in readability when compared with the older edition. It is to be noted that, with the exception of the 3¹ reader, all readability levels were found to be within the one grade level limitation as set forth by Fry (Fry, 1968).

CONCLUSIONS AND IMPLICATIONS

A review and analysis of the research clearly established a positive correlation between the grade levels determined by Fry's Readability Graph and the prescribed grade levels of the 1981 Scott, Foresman & Co. basal texts. The positive correlation, as noted above, is not intended to imply unqualified endorsement or acceptance of the results obtained.

Aside from moderate intra-grade level increases in difficulty, the analysis of the readability levels of the 1981 edition were similar to those established in the 1978 edition. In interpreting the results, it should be remembered that readability is merely an estimate, and the scores are determined to be accurate within a grade level (Fry, 1968).

Analysis of each basal text revealed a wide variation of grade levels from story to story. Moreover, there was no linear progression of story difficulty within each textbook. Although the mean or average readability of a specific reader correlated to grade level, any conclusion would require further examination and may very well be misleading. Educators would be well advised to refer to the specific grade level and story for a more accurate description of the readability estimate. By way of further limitation, the educator must consider the imprecise nature of Fry's Readability Formula. This two step analysis would

enable the teacher to accurately assess the readability level encountered.

The Fry Readability Formula indicates that passages are more easily understood and comprehended where there are fewer syllables and shorter sentences. If a particular story or text has a high readability level, the teacher should scan through the story to observe whether there are any particular multi-syllable words that reoccur and, therefore, may account for the high readability score. It is up to the educator to take the initiative in determining the appropriateness of texts and not to rely on the publisher. Syllables and sentence length are only two of many factors involved in the appropriateness of a text.

Another deficiency was observed in the third grade texts. Their readability levels (4.1 and 4.0 respectively) indicated that the material might be too difficult for the average third grade student. This example of improper story selection demonstrated the lack of concern or knowledge by the publisher to establish a proper readability level.

Thus, based upon the specific readability level problem encountered in the third grade texts in particular, and the variation of readability levels encountered in all the texts in general, there appears to be a need for the publisher to re-edit each text to eliminate these deficiencies. With the exception of the third grade texts, this problem could be easily solved by redesigning the existing

stories to cause a gradual increase in the readability level by placing the least difficult stories at the beginning and the most difficult ones toward the end; while interspacing grade level stories throughout to insure continuity and to reduce student frustration.

READABILITY: RELATED LITERATURE AND RESEARCH

Readability is a problem that has confronted educators for several decades. Studies, in this area, have evolved successful techniques and procedures to cope with the problems inherent in educating children. In its infancy, readability studies proved to be somewhat inaccurate, which was the result of time consuming and ambiguous procedures to arrive at the desired result. More recent studies have evolved methods noted for their high degree of accuracy and their ease of computation. This field of research continues to develop new modes to determine readability levels of printed material.

The groundwork for readability formulae was established by Thorndike in 1921 when he published The Teacher's Word Book. This work contained the most frequently used words in the English language. It had great influence upon educators and was used as the basis for the restriction of vocabulary in books used in elementary schools.

During the early 1920's, educators and librarians, frustrated in their efforts to elicit readability levels, began to look for methods to assess the difficulty of a book without actually reading it. One of the first major studies in this area was published by Lively & Pressey (1923). They refined Thorndike's word list using a sample of one thousand words and assigning to each a difficulty value. This method was subsequently discarded because it was time consuming, requiring three hours per book. Thereafter, McCall & Crabbs

(1925) examined graded reading passages as a more useful criteria for the construction of readability formulae. Their process required several steps limiting its usefulness.

In 1935, Gray & Leary surveyed numerous librarians, publishers, professors and readers which was used as the basis of an improved readability formula. The formula was divided into four categories: content, style of expression, format and organization. This method utilized an eight factor equation rendering it cumbersome. This formula was refined by Lorge (1939) who reduced it from eight factors to three basic elements. Unfortunately, his simplified technique sacrificed accuracy for efficiency.

The future emphasis of readability studies was altered by Rudolf Flesch (1943) who popularized the concept of readability through plain speech. He created a new era based upon word length and style through his "Reading Ease" formula (Maxwell 1978). His formula was extremely difficult to manipulate. Educators continued to search for a method to determine the difficulty of a written passage. Dale and Chall (1948) refined Flesch's formula using a larger word list as a better predictor, and a shorter, more easier defined formula. Subsequent studies by Dolch (1948), Gunning (1952), Lorge (1959) and others attempted to ascertain easier techniques to determine readability levels.

Until the advent of Edward Fry's Readability Graph (1968), the complexity and length of readability formulae made their usefulness limited to reading researchers and specialists. Fry's formula enabled teachers and librarians to determine readability levels through its simplified mathematical computations. This method constituted an improvement upon earlier formulas of Flesch, Dale-Chall and Spache. When compared, all formulas will yield the same results, i.e., readability level. Yet, Fry's Readability Graph is most easily interpreted, has the least amount of variables to score and maintains the same degree of accuracy. It is the most favored method due to its ease of use and low errors (Vaughn 1976).

Unlike other formulae, Fry's Readability Graph does not require special equipment and has been described as accurate to within a grade level (Fry 1968). The Fry formula has been validated on both primary and secondary materials. The popularity of this formula led to the extension of the graph downward through the primer and pre-primer levels (Maginnis 1969).

Interpretation of readability is an ongoing problem. In 1969, McLaughlin published his SMOG formula whose scores disagreed with those of Fry and Dale-Chall, thus creating concern among educators. Pauk (1969) reported these discrepancies and cautioned on the accuracy of the SMOG formula. A study at the University of Arizona (Vaughn

1976) confirmed the inaccuracy of the SMOG formula and the consistency of Dale-Chall and Fry scores. Findings indicated that SMOG scores tended to be two grades higher than those of the other two methods. Vaughan (1976) found both Fry's graph and the SMOG formula to be valid, determining the problem to be a difference in predictive criteria. Criterion scores associated with SMOG contain 90 to 100 percent accuracy in comprehension, while Fry scores indicate 50 to 75 percent accuracy in comprehension. Thus, both methods accurately assess readability level.

While much has been written on the importance of readability and the need for readability formulae, little research has been attempted concerning the actual readability of specific textbooks (Bradley & Ames 1977). Strang (1944), realizing teachers' concern for readability, published an annotated graded list for slow learners.

Bradley & Ames (1977) maintained that readability data could improve effectiveness and efficiency of instruction. Their study of the readability of six basal readers found extreme variations in readability level and suggested that more research was required on other basals. Discrepancies in readability levels prompted Eberwein (1979) to conclude that the average textbook analyzed had a range of 4.65 levels. He also concluded that most teachers are unaware of the variability in reading levels in a given textbook. One of the most recent studies done in this field is

a work entitled Foxie which used Fry's Readability Graph to determine the readability levels of nineteen basal text systems from 1970-1978. Results of this study indicated that there was a 3-5 grade range of stories in most books; 63% of the books had stories above grade level; 27% at grade level and 10% below grade level (Foxie 1979).

Researchers caution that readability formulae have limitations. Few methods take the reader into account. Taylor (1953) developed the "cloze test", in which a passage with every fifth word missing is supplied by the student. This procedure, while correlating with other readability formulae (Bormuth 1962), is more time consuming than other methods and requires the testing of students.

Concern for readability of a text has prompted publishers and writers to make written material more readable. However, research suggests that there is a limit to how readable material can become. Hebb & Bindra (1952) cautioned that making something easier doesn't always mean it will be easier or more liked. They suggested that books that are difficult often become easier once the student understands the language used.

Readability methods generally rely on word length, word frequency and sentence length. Klare (1975) opines that sentence complexity may be the one most important factor in measuring reading difficulty. He found length to correlate highly with sentence and complexity and found this

an easier factor. They do not take into account semantics or syntax. They are not concerned with comprehension, maturity, the intelligence or interests of readers. Readability formulae measure only difficulty. However, they provide a useful guideline for the easy identification of a book's difficulty.

The teacher must, when using readability formulas, take into account the ability of the students to understand the material and should be aware of frustration potential. Readability formulas have the advantage of being well known and can be used without special training and equipment.

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